



## ગુજરાત જાહેર સેવા આયોગ

સેક્ટર - ૧૦-એ, ૭-૩ સર્કલ પાસે, ૭ રોડ,  
ગાંધીનગર - ૩૮૨૦૧૦

જાહેરાત ક્રમાંક: ૭૯/૨૦૨૪-૨૫, મદદનીશ પર્યાવરણ ઇજનેર, વર્ગ-૨ (GPCB) ની જગ્યા પર  
ભરતી માટેની પ્રાથમિક કસોટીમાં ભાગ-૧ અને ભાગ-૨ ના ૧૮૦ મિનિટના સંયુક્ત  
પ્રશ્નપત્રનો અભ્યાસક્રમ

### સીધી પસંદગીથી ભરતીની પ્રાથમિક કસોટીનો અભ્યાસક્રમ ભાગ-૧

માધ્યમ: ગુજરાતી

કુલ ગુણ : ૧૦૦

મુદ્દા	વિષય	ગુણ
૧	ભારતની ભૂગોળ- ભૌગોલિક, આર્થિક, સામાજિક, કુદરતી સંસાધન અને વસ્તી અંગેની બાબતો- ગુજરાતના ખાસ સંદર્ભ સાથે	
૨	ભારતનો સાંસ્કૃતિક વારસો- સાહિત્ય, કલા, ધર્મ અને રચાપત્યો- ગુજરાતના ખાસ સંદર્ભ સાથે	
૩	ભારતનો ઇતિહાસ- ગુજરાતના ખાસ સંદર્ભ સાથે	
૪	ભારતની અર્થવ્યવસ્થા અને આયોજન	
૫	ભારતીય રાજનીતિ અને ભારતનું બંધારણ: (૧) આમુખ (૨) મૂળભૂત અધિકારો અને હરખે (૩) રાજ્યનીતિના માર્ગદર્શક સિદ્ધાંતો (૪) સંસદની રચના (૫) રાષ્ટ્રપતિની સત્તા (૬) રાજ્યપાલની સત્તા (૭) ન્યાયતંત્ર (૮) અનુસૂચિત જાતિ, અનુસૂચિત જાતિ અને સમાજના પછાત વર્ગો માટેની ખેગવાઈઓ (૯) નીતિ આયોગ (૧૦) બંધારણીય તથા વૈધાનિક સંસ્થાઓ- ભારતનું ચૂંટણી પંચ, કોમ્પ્યુટર એન્ડ ઓડિટર જનરલ, માહિતી આયોગ	૩૦
૬	સામાન્ય વિજ્ઞાન, પર્યાવરણ અને ઈન્ફર્મેશન એન્ડ કોમ્યુનિકેશન ટેકનોલોજી	૧૦
૭	ખેલ જગત સહિત રોજબરોજના પ્રાદેશિક, રાષ્ટ્રીય અને આંતરરાષ્ટ્રીય મહત્વના બનાવો	૧૦
૮	સામાન્ય બૌદ્ધિક ક્ષમતા કસોટી (૧) તાર્કિક અને વિશ્લેષણાત્મક ક્ષમતા (૨) સંખ્યાઓની શ્રેણી સંકેત અને તેનો ઉકેલ. (૩) સંબંધ વિષયક પ્રશ્નો. (૪) આકૃતિઓ અને તેના પેટા વિભાગ, વેન આકૃતિઓ (૫) ઘડીચાળ, કેલેન્ડર અને ઉંમર સંબંધિત પ્રશ્નો. (૬) સંખ્યા વ્યવસ્થા અને તેના માનક્રમ.	૩૦

	<p>(૭) શૈક્ષિક સમીકરણ (એક કે બે ચલમાં)</p> <p>(૮) પ્રમાણ, હિસ્સો અને ચલ.</p> <p>(૯) સરેરાશ યા મધ્યક, મધ્યસ્થ અને બહુલક, ભારિત સરેરાશ.</p> <p>(૧૦) ઘાત અને ઘાતાંક, વર્ગ, વર્ગમૂળ, ઘનમૂળ, ગુ.સા.અ. અને લ.સા.અ</p> <p>(૧૧) ટકા, સાદુ અને ચક્રવૃદ્ધિ વ્યાજ, શક્તિ અને ગુણજ્ઞાન.</p> <p>(૧૨) સમય અને કાર્ય, સમય અને અંતર, ઝડપ અને અંતર.</p> <p>(૧૩) સરળ ભૌતિક આકૃતિઓના ક્ષેત્રફળ અને પરિમિતિ, જથ્થો અને સપાટીનો વિસ્તાર (છ સમાંતર બાજુ ધરાવતો ઘન, ઘન, સિલિન્ડર, શંકુ આકાર, ગોળાકાર).</p> <p>(૧૪) રેખા, ખૂણા અને સામાન્ય ભૌમિતિક આકૃતિઓ-સાદી કે ત્રાંસી સમાંતર રેખાઓના ગુણધર્મો, ત્રિકોણની સાપેક્ષ બાજુઓના માપનના ગુણધર્મો, પાયથાગોરસનો પ્રમેય, ચતુર્ભુજ, લંબગોળ, સમાંતર બાજુ ચતુષ્કોણ, સમભુજ ચતુષ્કોણ.</p> <p>(૧૫) બીજગણિતનો પરિચય-BODMAS-કાનાભાગુવઓ-વિચિત્ર પ્રતિકોની સરળ સમજૂતિ.</p> <p>(૧૬) માહિતીનું અર્થઘટન, માહિતીનું વિશ્લેષણ, માહિતીની પર્યાપ્તતા, સંભાવના</p>	
૯	<p>ગુજરાતી વ્યાકરણ (ગુજરાતી માધ્યમ-Gujarati Medium Only)</p> <p>(૧) બેડણી</p> <p>(૨) સમાનાર્થી-વિરુદ્ધાર્થી શબ્દો</p> <p>(૩) રૂઢિપ્રયોગો અને કહેવતો</p> <p>(૪) સમાસ</p> <p>(૫) સંધિ</p> <p>(૬) અલંકાર</p> <p>(૭) છંદ</p>	૧૦
૧૦	<p>English Grammar (અંગ્રેજી માધ્યમ- English Medium Only)</p> <p>(1) Articles, Pronouns, Adjectives, Prepositions, Conjunctions and Question tag.</p> <p>(2) Verb and Tense, Agreement between subject and verb, Gerund, Participles.</p> <p>(3) Modal auxiliaries. Usage of can, may, could, should, etc.</p> <p>(4) Use of some, many, any, few, a little. Since and for.</p> <p>(5) Active and passive voice</p> <p>(6) Degrees of adjectives.</p> <p>(7) Common errors of usage.</p>	૧૦

❖ મુદ્દા ક્રમાંક ૮ થી ૧૦ માટેનો અભ્યાસક્રમ ધોરણ- ૧૨ સમકક્ષ રહેશે.

**Syllabus for preliminary test for recruitment from Direct Selection****Part-1****Medium: Gujarati****Total Marks: 100**

Point No	Subject	Marks
1	Geography of India – Geographical, Economic, Social, Natural Resources and Population related topics – With Special reference to Gujarat	30
2	Cultural Heritage of India – Literature, Arts, Religion and Architecture - With Special reference to Gujarat	
3	History of India- With Special reference to Gujarat	
4	Indian Economy and Planning	
5	Indian Politics and Constitution of India: (1) Preamble (2) Fundamental Rights and Fundamental Duties (3) Directive Principles of State Policy (4) Composition of Parliament (5) Powers of the President of India (6) Powers of Governor (7) Judiciary (8) Provisions for Scheduled Casts, Scheduled Tribes and Backward Classes of the society (9) NITI Aayog (10) Constitutional and Statutory Bodies: Election Commission of India, Comptroller and Auditor General, Information Commission	
6	General Science, Environment and Information & Communication Technology	10
7	Daily events of Regional, National and International Importance including Sports	10
8	General Mental Ability Test (1) Logical Reasoning and Analytical Ability (2) Number Series, Coding-Decoding (3) Questions about relationship. (4) Shapes and their Sub-sections, Venn Diagram (5) Questions based on Clock, Calendar and Age (6) Number system and order of Magnitude (7) Linear Equations - in one or two Variables (8) Ratio, Proportion and Variation (9) Average of Mean, Median, Mode- including weighted Mean (10) Power and Exponent, Square, Square Root, Cube Root, H.C.F. & L.C.M. (11) Percentage, Simple and Compound Interest, Profit and Loss (12) Time and Work, Time and Distance, Speed and Distance (13) Area and Perimeter of Simple Geometrical Shapes, Volume and Surface Area of Sphere, Cone, Cylinder, Cubes and Cuboids (14) Lines, Angles and Common geometrical figures - properties of transverse or parallel lines, properties related to measure sides of a triangle, Pythagoras theorem, quadrilateral, rectangle, Parallelogram and rhombus. (15) Introduction to algebra-BODMAS, simplification of weird Symbols. (16) Data interpretation, Data Analysis, Data sufficiency, Probability	30

9	<p>Gujarati Grammar (ગુજરાતી માધ્યમ-Gujarati Medium Only)</p> <p>(૧) જોડણી  (૨) સમાનાર્થી-વિરુદ્ધાર્થી શબ્દો  (૩) રૂઢિપ્રયોગો અને કહેવતો  (૪) સમાસ  (૫) સંધિ  (૬) અલંકાર  (૭) છંદ</p>	10
10	<p>English Grammar (અંગ્રેજી માધ્યમ- English Medium Only)</p> <p>(1) Articles, Pronouns, Adjectives, Prepositions, Conjunctions and Question tag.  (2) Verb and Tense, Agreement between subject and verb, Gerund, Participles.  (3) Modal auxiliaries. Usage of can, may, could, should, etc.  (4) Use of some, many, any, few, a little. Since and for.  (5) Active and passive voice  (6) Degrees of adjectives.  (7) Common errors of usage.</p>	10

❖ The standard of the syllabus for point no. 8 to 10 will be equivalent to Standard 12.

**Syllabus for the Preliminary Exam of Assistant Environmental Engineer,**  
**Class-2 under the Gujarat Pollution Control Board (GPCB)- (Part-B) (part-2)**

**Marks : 200**

**Questions: 200**

**Medium: English**

**1. Provisions in Constitution of India and International Conventions & Treaties Related to Environment:**

Constitutional Provisions, Important Provisions of Bharatiya Nyaya Sanhita (BNS), Bharatiya Nagarik Suraksha Sanhita (BNSS), International Conferences, Conventions and Summits, The National Environment Policy, 2006, Fundamental principles of Sustainable Development, Precautionary Principle, Polluter Pays Principle, Extended Producer's Responsibility etc., Clean Development Mechanism (CDM), International Steps for Mitigating Global Environmental Change.

**2. Global environmental issues:**

Climate Change, Global Warming and Green House Effect, Acid Rain, Depletion of Ozone layer, Carbon Footprint

**3. Hydrosphere:**

Origin of water, Occurrence and sources of water – Surface & Ground water, Hydrosphere and Water resources, Global Distribution of water, Hydrological cycle and its balance, Properties of sea water

**4. Atmosphere:**

Introduction, structure, Chemical composition of Air, Particles, ions and radicals in the atmosphere, Ozone Chemistry, Thermo chemical and Photochemical reactions in the atmosphere, Meteorology fundamentals: Pressure, Temperature, Wind, Humidity, Radiation, Atmospheric stability, Wind roses.

**5. Non-renewable Sources of Energy:**

Fossil fuels: Classification, composition, physio-chemical characteristic and energy content of coal, petroleum and natural gas. Mining and uses of coal, oil and natural gas.

**6. Renewable Sources of Energy:**

Solar Energy, Wind Energy, Generation of Hydro Power, Ocean thermal energy conversion (OTEC), Tidal Energy

**7. Water Pollution & its Control:**

**Standard and norms:** Drinking water standards, Domestic & Industrial Effluent Standards

**Water Pollution:** Sources of Water Pollution, Classification of water pollutants – Organic, Inorganics, Heavy Metals etc., Effects of water pollutants, water pollution control mechanisms, Microbiology of Water & Wastewater, and its control mechanism.

**Water and wastewater treatment-Unit operations-Unit processes:** Effluent Quality: Physical, chemical and biological parameters. Primary, Secondary and tertiary treatment (Conventional & Latest Technologies): Physical processes, chemical processes, and biological processes. Mixing, Clarification - Sedimentation; Types; Aeration and gas transfer – Coagulation and flocculation, coagulation processes. Stability of colloids - destabilization of colloids transport of colloidal particles, Clariflocculation. Biological Systems – Types, Design & Operational Parameters, Adsorption, adsorption equilibria-adsorption isotherms, Disinfection - chlorination ; ozonation, UV radiation. Advance waste water treatments. Ion Exchange-processes, Application Membrane Processes, Reverse osmosis, Ultrafiltration, Electrolysis. Water/Wastewater Quality Monitoring: Sampling techniques, Preservation of water sample, Physical and chemical properties of water. Zero Liquid Discharge Processes

**Mode of Effluent Disposals and Standards:** Disposal in to Land, Disposal in to Surface water bodies, i.e. Lakes & Rivers, Disposal in to Marine environment, Public Sewers and CETP. Specialty Treatment for concentrated industrial waste: Incineration, Evaporation: Natural & Forced evaporation, Spray Dryers, MVR, ATFD.

**Legislations:** Water (Prevention & Control of Pollution) Act, 1974 and its amendments

## 8. Air Pollution & its Control:

**Standard and norms:** Ambient air quality standards, Flue Gas Emission & Process Gas Emission Standards.

**Air pollution** – Sources and classification of pollutants and their effect on human health, vegetation and property, Reactions of pollutants and their effects, Atmospheric diffusion of pollutants - Transport, transformation and deposition of air contaminants, stack height criteria and dispersion modeling. Types and Process of Air Quality monitoring – Ambient Air Quality monitoring, Source Air Quality monitoring, Monitoring and Sampling techniques. Industrial Fuels, Combustions, Air to Fuel Ratios and Flue Gas Emissions. Odour nuisance & its control.

**Particulates Pollutants:** Introduction, working Principle, Design Adequacy, Construction, Components, Industrial applications, performance parameters for: Gravity Settler, Cyclone separator, Bag filters, and Electrostatic precipitator.

**Gaseous Pollutants:** Introduction, working Principle, Design Adequacy, Construction, Components, Industrial applications, performance parameters of air pollution control devices, such as stripping, scrubbing, adsorption etc. systems for control of various gaseous air pollutants.

**Legislations:** Air (Prevention & Control of Pollution) Act, 1981 and its amendments, Ozone Depleting Substances (Regulation & Control) Rules, 2000, Fly Ash Notification, 2021.

## 9. Noise Pollution and its control:

**Standard and norms:** Noise Emission Standards.

**Noise pollution:** Introduction, Sound and Noise, Noise Measurements, Causes and Effects, noise pollution control measures/ devices.

**Legislations:** Noise Pollution (Regulation and Control) Rules 2000 and its amendments.

## 10. Hazardous waste management:

Classification and Generation of Hazardous Waste, Mode of Treatment, Mode of Storage and Mode of Disposal of Hazardous Waste. Leachate Management, Use of environmental sound technologies for treatment and disposal of hazardous wastes including recycling and goal of minimizing Hazardous Wastes. Treatment and disposal methods of Hazardous Waste. TSDF, Incineration System, Pre-Processing & Co-processing. Physico-chemical processes, biological process, stabilization and solidification; Thermal methods. Sludge handling and management. Bio-medical Waste: Generation and management. E-waste: Generation and management.

**Legislations:** The Hazardous & Other Wastes (Management and Transboundary Movement) Rules 2016 and its amendments, Bio-medical Waste (Management and Handling) Rules 2016 and its amendments, E-waste Management Rules 2022 and its amendments, Battery Waste Management Rules, 2022 and its amendments, Manufacture, Storage & Import of Hazardous Chemicals Rules, 1989.

## 11. Solid Waste Management

Introduction, Methods for collection, Storage, segregation, transportation. Disposal methods landfills, composting, anaerobic digestion, incineration, pyrolysis. Current/Latest Practices such as Waste to Energy.

**Legislations:** Solid Waste Management Rules 2016 and its amendments, Plastic Waste Management Rules 2016 and its amendments, Construction & Demolition Waste Management Rules 2016 and its amendments.

**12. Other environment legislations:**

Environment (Protection) Act 1986 and its amendments, National Green Tribunal Act 2010, The Public Liability Insurance Act 1991, Provisions of the Jan Vishwas (Amendment of Provisions) Act, 2023 related to Environmental laws, Coastal Regulation Zone Notification, and other relevant acts/rules.

EIA Notification 2006 and its amendments. Fundamentals of Environment Impact Assessment (EIA) report preparation – Concept, Methodologies, Screening, Scoping, Baseline Studies, Mitigation, Matrices, Checklist, Public Consultation.

**13. Environmental Science and Ecological process:**

Ecology, Ecosystem, Biodiversity, Bioaccumulation, Biomagnification, Eutrophication, Bioindicators, Biomonitoring, Bioassay, Bioremediation

**14. Basics of Significance, Sampling, Preservation and Analysis of parameters of Water & Wastewater, Air and Hazardous Wastes**

**15. Chemical Unit Operations & Processes. Basics Heat Transfer Operations: Basics of Heat Transfer- Conduction, Convection, Radiation. Evaporation. Heat Exchangers. Concept of Mass & Energy Balance and Basic Stoichiometric Calculations**

**16. Mass Transfer Operations:**

Distillation – Vapor Liquid Equilibrium, Steam distillation, Batch distillation, Azeotropic distillation, Fractional distillation. Humidification. Absorption and stripping, Type of Solvent, Solvent Properties, Characteristics and Requirement, Solvent Recovery. Applications of Gas Absorption & Stripping. Adsorption – Adsorbent properties & selection. Adsorption and desorption. Drying, Crystallization, Evaporation, Liquid- Liquid extraction, Solvent selection, Steam Recovery.

**17. Basics of Occupational Health and Safety:**

Occupational Health Hazards & Environmental Diseases, Hazard Identification & Risk Assessment, Safety Management

**18. Current trends and recent advancement in the above fields.**



**(Prasun Patel)**  
**DEPUTY SECRETARY**  
**GUJARAT PUBLIC SERVICE COMMISSION**